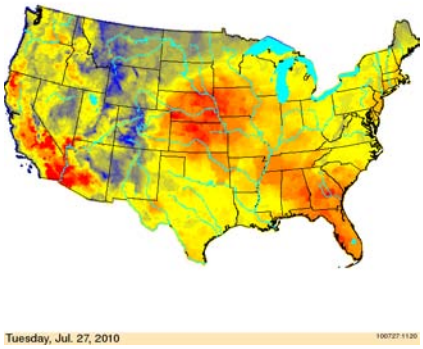
U.S. Meat Animal Research Center
Environmental Management Research Unit

Scientists in the Environmental Management Research Unit are working on high priority environmental issues of the animal feeding industries in the U.S. such as:

- ***Heat Stress***
- ***Manure Management***
- ***Feeding Ethanol Byproducts***
- ***Climate Change, Odor, and Air Quality***



Heat Stress

In 2009, a single catastrophic heat wave caused the death of thousands of cattle at an estimated loss of $20 million. USMARC scientists are working on three distinct components to this devastating problem: 1) Indentifying animals that are susceptible to heat stress, 2) Characterizing weather patterns that result in the most stressful events, 3) Investigating different management strategies to reduce the impact of the stress. This multifaceted approach combines these three components to provide every animal with the appropriate level of care thus ensuring maximum well-being while keeping profitability in mind. The heat stress forecast map (left) was developed using an algorithm developed by our scientists and forecast data provided by NOAA. The seven day forecast can be found at www.marc.usda.gov and then click the Cattle Heat Stress tab.

Manure Management

More than 20 million beef cattle are fed in the U.S. producing nearly 100 million tons of manure annually. The fertilizer value of this manure exceeds $200 million. Improperly managed manure can result in soil, water, and air contamination. USMARC scientists have developed novel methods for assessing the effectiveness of manure applied to soil as a fertilizer. Also, they have pioneered technologies and methods for evaluating the nutrient and energy value of manure on the feedlot surface. These advances have improved environmental sustainability and reduced the risk of contamination while using manure as a resource.

Ethanol Byproducts

The recent boom in corn ethanol production has produced an abundance of ethanol byproducts. In Nebraska alone, the annual processing of 16.8 million tons of corn produces 5 million tons of 'distillers grains' byproducts. These byproducts are highly nutritious and are currently being fed to beef and swine. There is evidence that the feeding of ethanol byproducts contributes to higher odor emissions, and more phosphorus, and pathogens in the manure. USMARC scientists are investigating methods to reduce the environmental impacts of feeding ethanol byproducts to livestock .

Odor Control and Air Quality

Odor is still one of the most important environmental issues in the vicinity of animal feeding operations. Working collaboratively with large swine feeding operations, USMARC scientists have identified technologies to reduce odor emissions from swine barns by 75%. Ongoing research is focused on reducing odor emissions from wastewater lagoons and feedlot surfaces. By studying the biological and microbial activities of odorant production, we will continue to benefit producers and the public by reducing overall odor emissions from animal feeding operations.

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